

Fig. 1

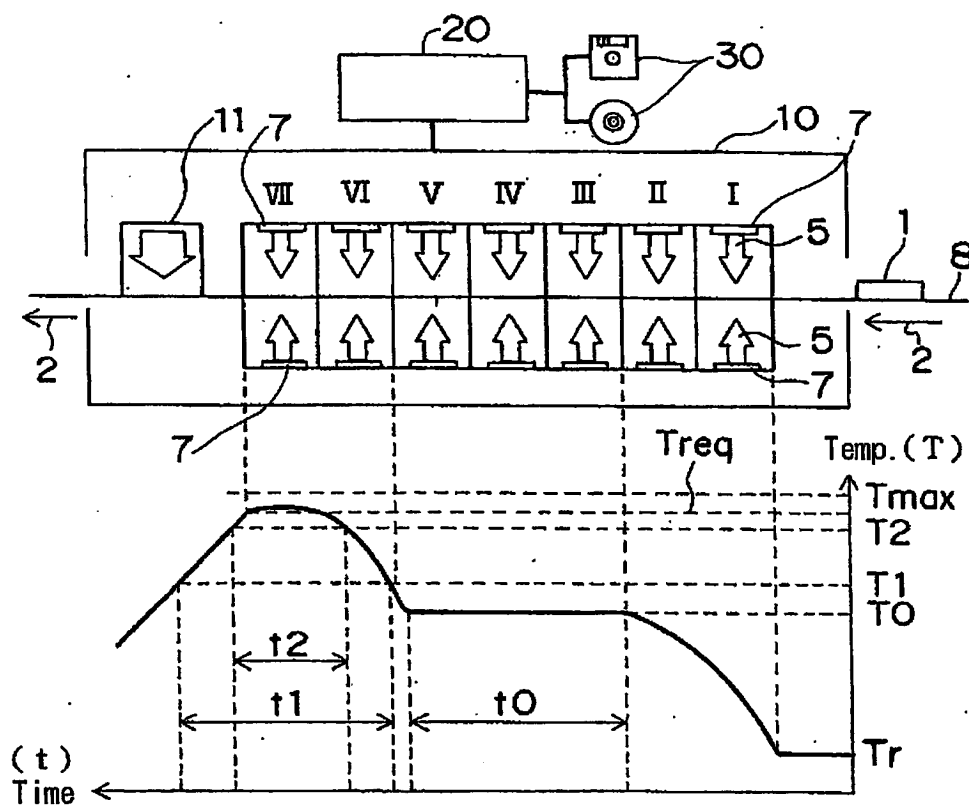
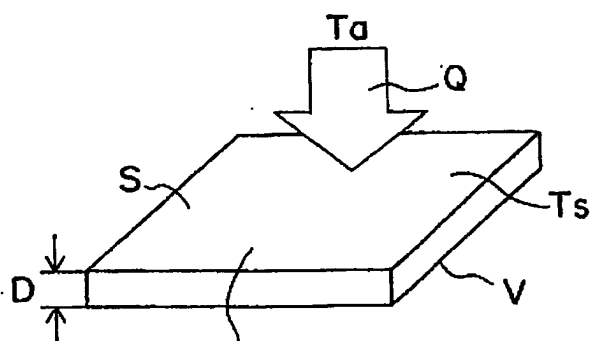


Fig. 2

measuring point:
physical characteristics { ρ : density
 C : specific heat
 h : rate of heat transfer

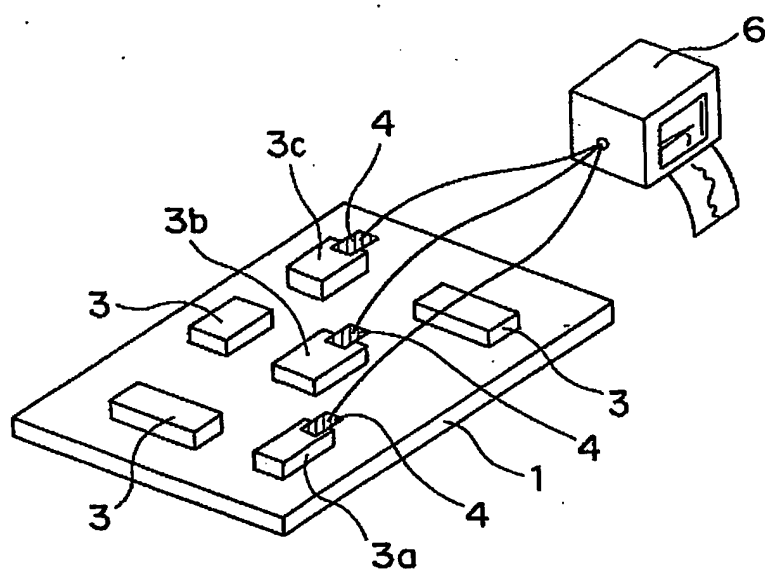
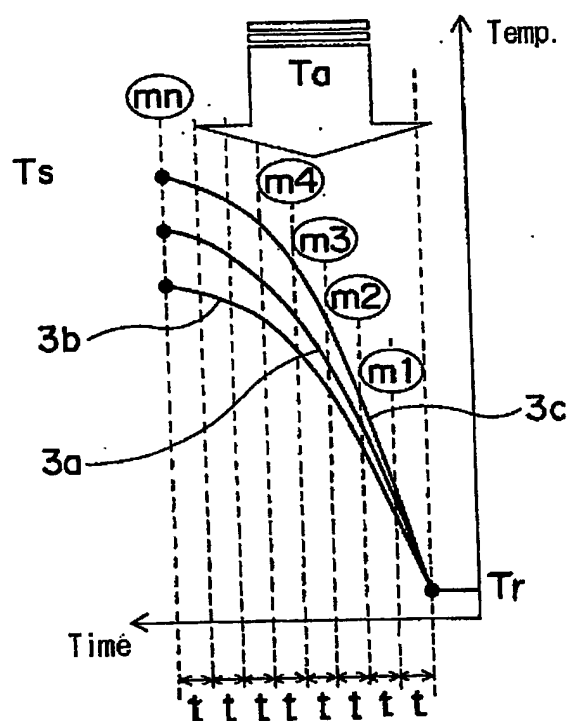
Fig. 3

Fig. 4



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Fig.5

(a)

Heating Sections	Reflow Stage		Preheat Stage				
	VII	VI	V	IV	III	II	I
Heating Temp.	240	240	190	190	190	190	190

V=1.25m/minute

(b)

Heating Sections	Reflow Stage		Preheat Stage				
	VII	VI	V	IV	III	II	I
Heating Temp.	240	277	190	190	190	259	259

V=1.25m/minute

(c)

Items	Simulation		
	3a	3b	3c
ΔT [°C]	4.8		
Peak Temp. [°C]	232.0	228.1	232.9
Time[sec] over 220°C	25.6	22.4	25.2
Time[sec] over 200°C	38.2	35.0	38.2

(d)

Items	Verification		
	3a	3b	3c
ΔT [°C]	6.3		
Peak Temp. [°C]	231.7	225.7	232.0
Time[sec] over 220°C	28.0	20.8	25.0
Time[sec] over 200°C	39.4	34.8	38.0

(e)

Items	Simulation - Verification		
	3a	3b	3c
ΔT [°C]	-1.5		
Peak Temp. [°C]	0.3	2.4	0.9
Time[sec] over 220°C	-2.4	1.6	0.2
Time[sec] over 200°C	-1.2	0.2	0.2

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Fig. 6

(a)

Heating Sections	Reflow Stage		Preheat Stage				
	VII	VI	V	IV	III	II	I
Heating Temp.	240	240	190	190	190	190	190

V=0.8m/minute

(b)

Heating Sections	Reflow Stage		Preheat Stage				
	VII	VI	V	IV	III	II	I
Heating Temp.	240	240	190	190	190	190	190

V=1.6m/minute

(c)

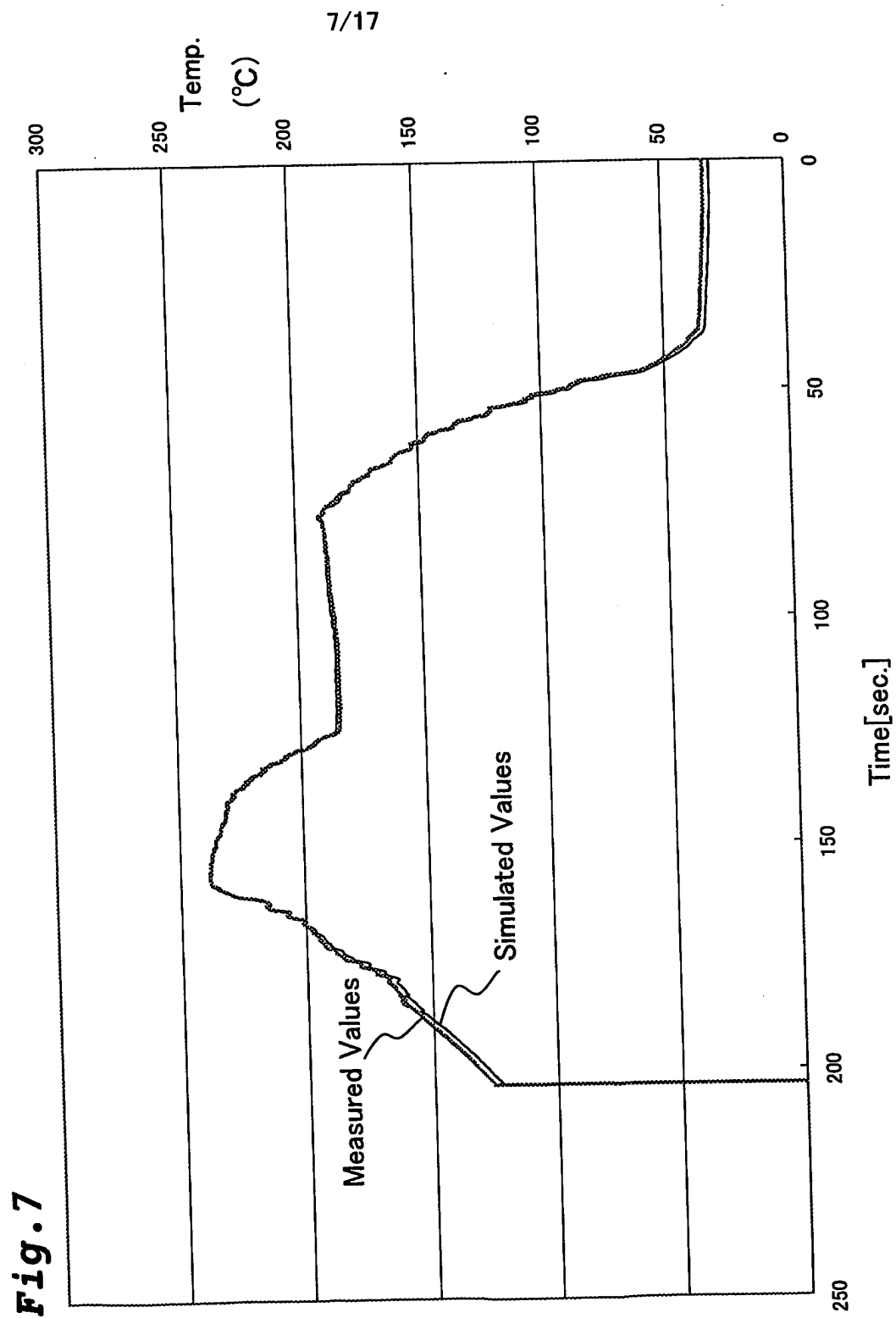
Items	Simulation		
	3a	3b	3c
ΔT [°C]	10.7		
Peak Temp. [°C]	213.3	202.6	210.8
Time[sec] over 200°C	20.6	5.7	15.2
Time[sec] over 180°C	37.6	26.9	33.3

(d)

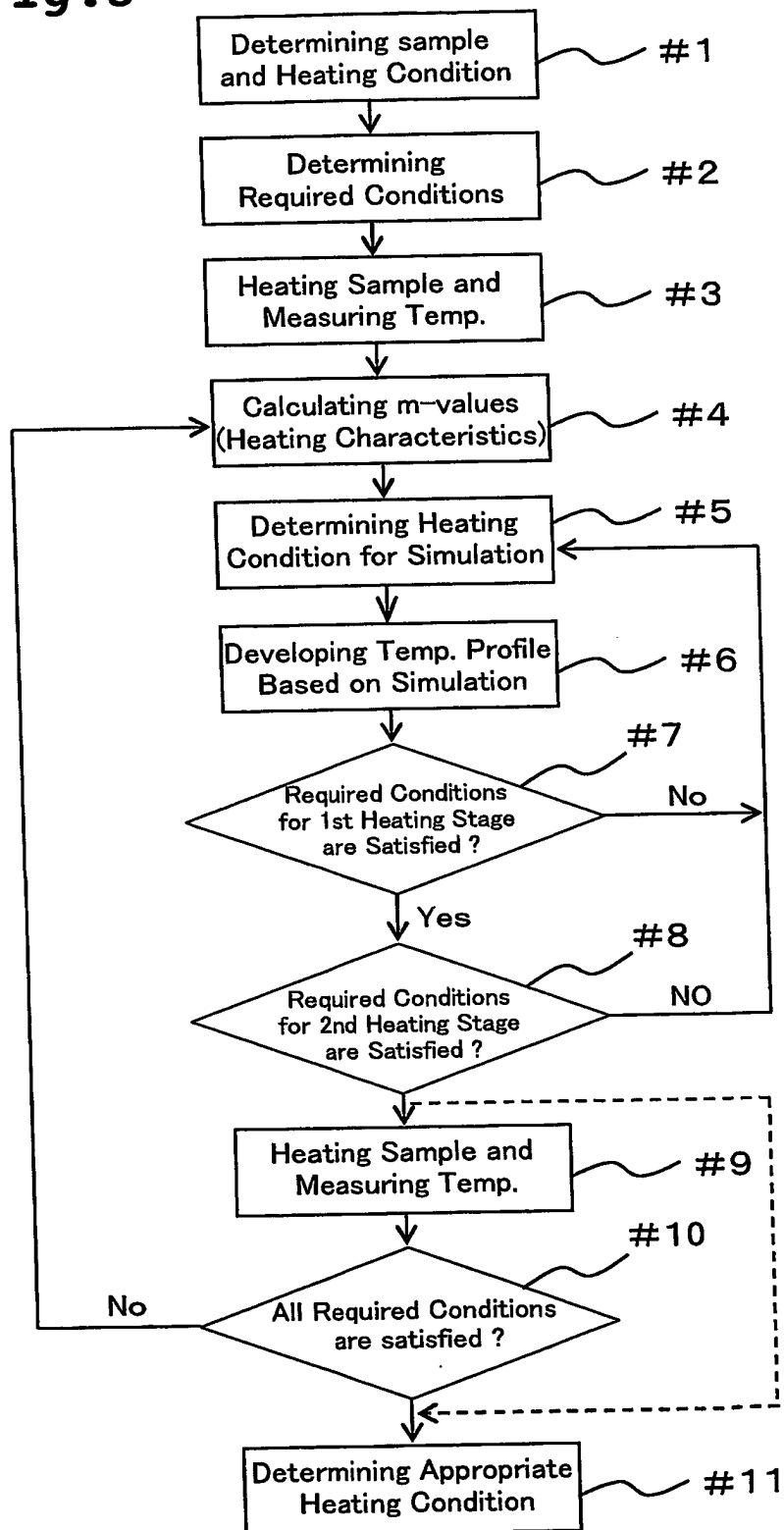
Items	Verification		
	3a	3b	3c
ΔT [°C]	8.4		
Peak Temp. [°C]	212.9	206.5	214.9
Time[sec] over 200°C	18.4	10.0	19.8
Time[sec] over 180°C	36.4	27.8	34.2

(e)

Items	Simulation - Verification		
	3a	3b	3c
ΔT [°C]	2.3		
Peak Temp. [°C]	0.4	-3.9	-4.1
Time[sec] over 200°C	2.2	-4.3	-4.6
Time[sec] over 180°C	1.2	-0.9	-0.9



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Fig. 8

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Fig. 9

(a)	Heating Sections	VII	VI	V	IV	III	II	I
	Heating Temp.	240	240	190	190	190	190	190

V=0.8m/minute								
(b)	Heating Sections	VII	VI	V	IV	III	II	I
	Heating Temp.	256	281	190	190	190	273	273

V=1.35m/minute								
(f)	Heating Sections	VII	VI	V	IV	III	II	I
	Heating Temp.	254	292	180	180	180	263	263

V=1.35m/minute								
(g)	Items	Simulation						
		3a	3b	3c				
(h)	ΔT [°C]	8.5						
	Peak Temp. [°C]	238.3	230.3	238.8				
	Time[sec] over 220°C	27.0	21.2	24.8				
	Time[sec] over 200°C	37.8	32.6	35.0				

V=1.35m/minute								
(c)	Items	Simulation						
		3a	3b	3c				
(d)	ΔT [°C]	5.8						
	Peak Temp. [°C]	236.0	231.0	236.8				
	Time[sec] over 220°C	25.7	22.0	25.6				
	Time[sec] over 200°C	39.0	34.7	37.9				

V=1.35m/minute								
(e)	Items	Simulation - Verification						
		3a	3b	3c				
(i)	ΔT [°C]	-1.4						
	Peak Temp. [°C]	-3.4	-1.9	-3.3				
	Time[sec] over 220°C	-3.3	-2.4	-2.2				
	Time[sec] over 200°C	-2.4	-1.1	0.9				

V=1.35m/minute								
(g)	Items	Simulation						
		3a	3b	3c				
(h)	ΔT [°C]	7.9						
	Peak Temp. [°C]	238.3	231.3	239.2				
	Time[sec] over 220°C	27.0	22.0	25.0				
	Time[sec] over 200°C	38.8	32.8	35.4				

V=1.35m/minute								
(i)	Items	Simulation - Verification						
		3a	3b	3c				
(i)	ΔT [°C]	0.6						
	Peak Temp. [°C]	0.0	-1.0	-0.4				
	Time[sec] over 220°C	0.0	-0.8	-0.2				
	Time[sec] over 200°C	-1.0	-0.2	-0.4				

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Fig. 10

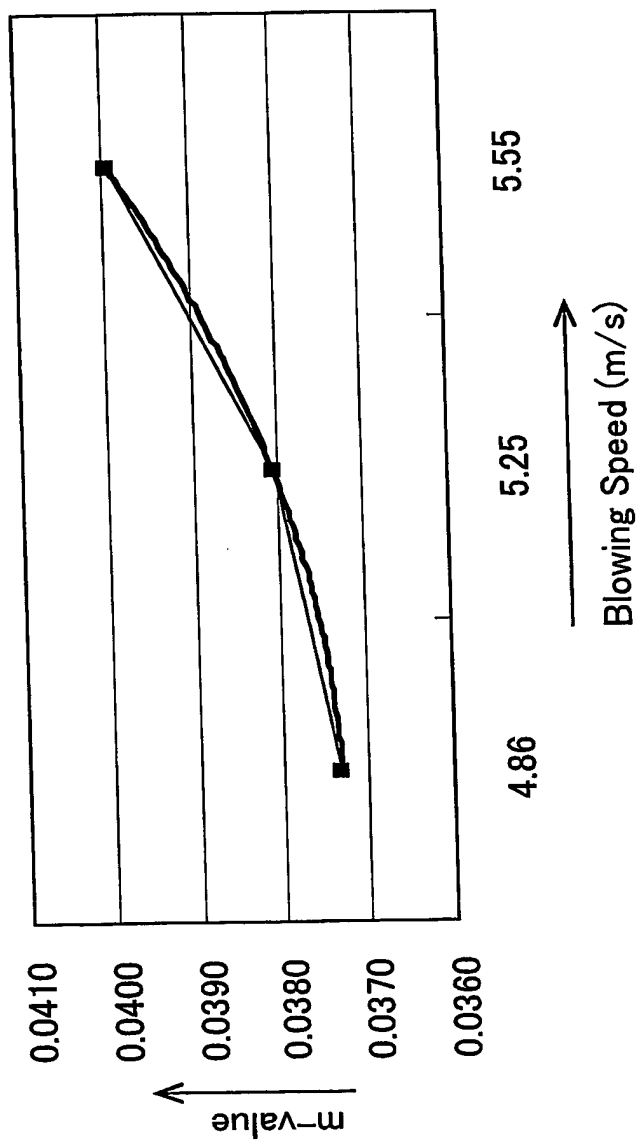
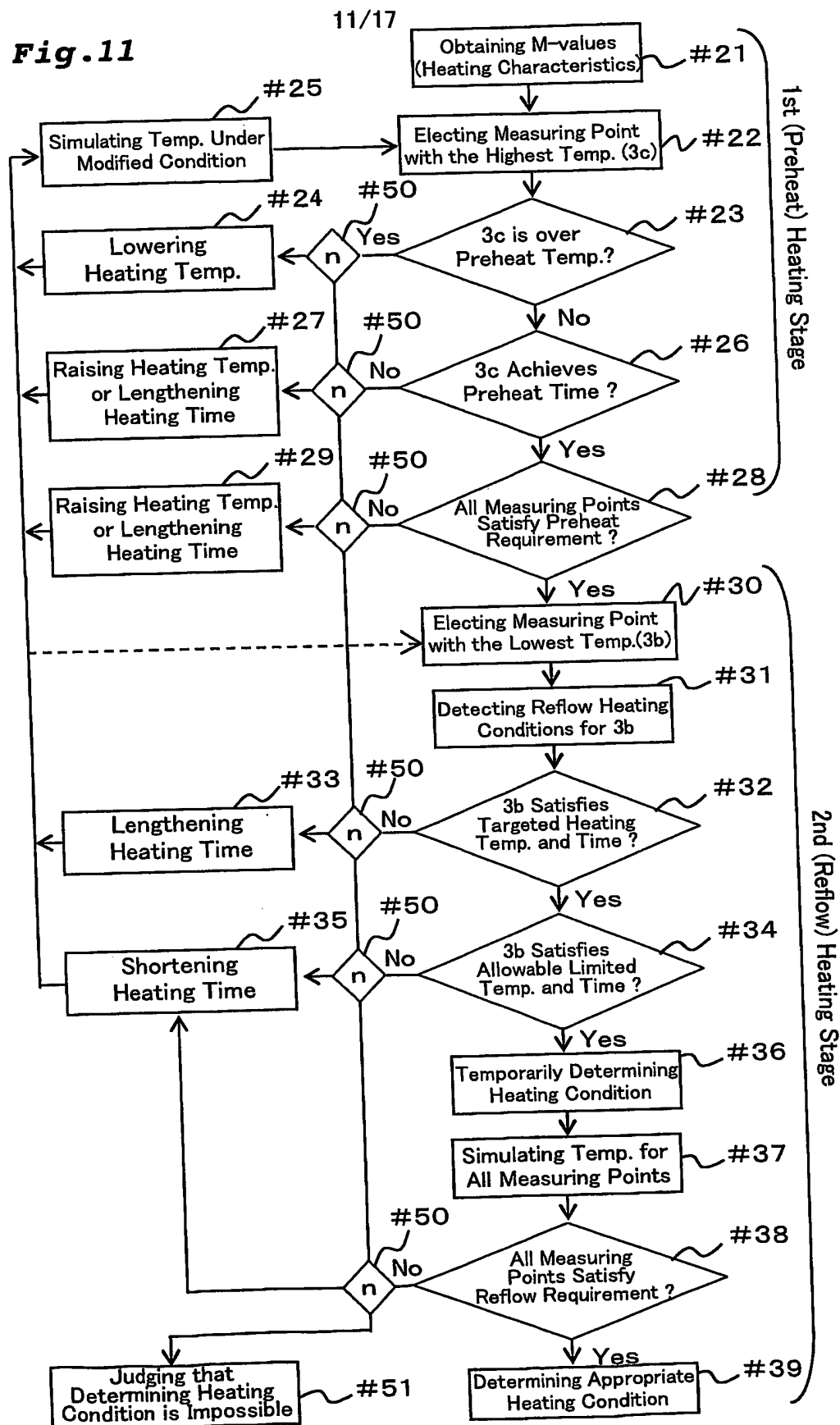


Fig. 11



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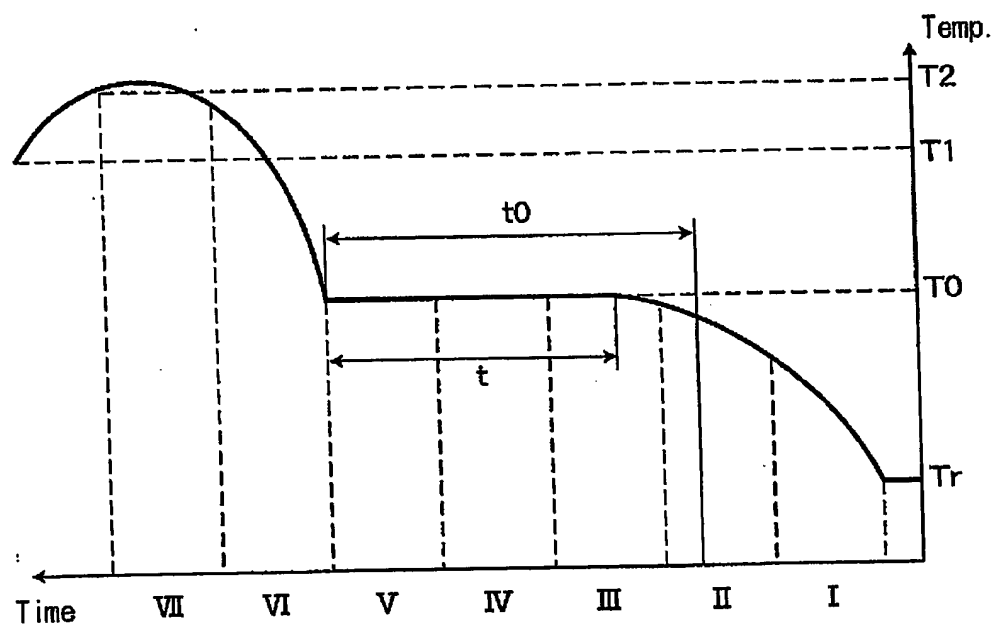
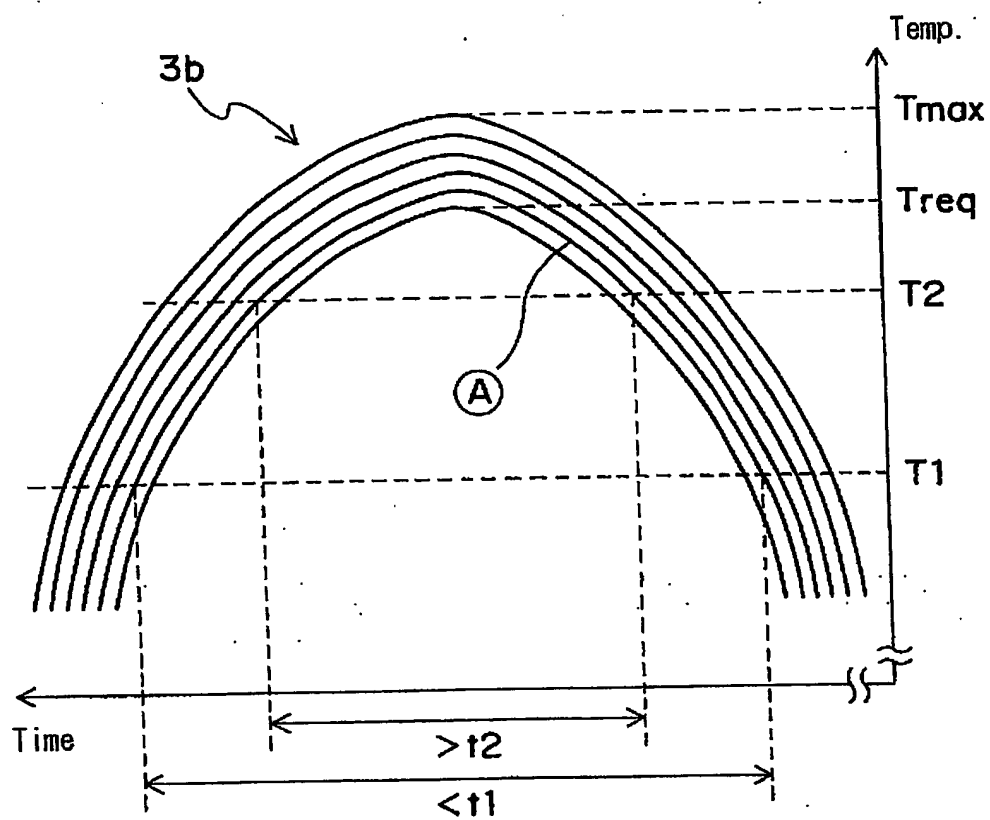
Fig. 12

Fig. 14



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Fig.15

(a) Unit:Second

Items	3a	3b	3c
Time(t2) over Targeted Heating Temp.(T2)	22	21	25
Time(t1) over Allowable Limited Temp.(T1)	40	39	42

(b) Unit:Second

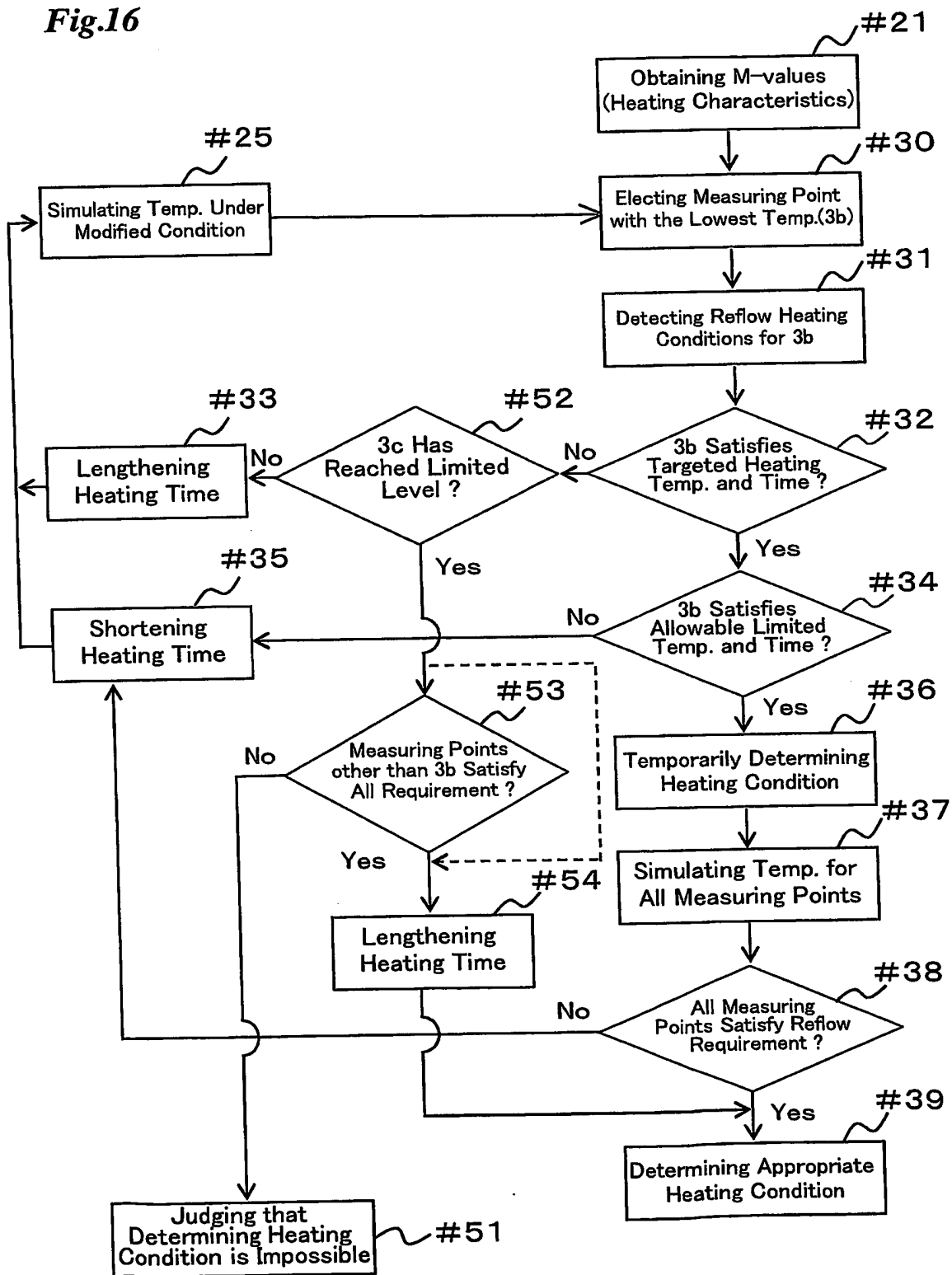
Items	3a	3b	3c
Time(t2) over Targeted Heating Temp.(T2)	20	18	22
Time(t1) over Allowable Limited Temp.(T1)	38	37	40

(c) Unit:Second

Items	3a	3b	3c
Time(t2) over Targeted Heating Temp.(T2)	21	20	23
Time(t1) over Allowable Limited Temp.(T1)	39	38	41

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Fig.16



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Fig.17

